THE DAIRY SITUATION AND OUTLOOK[1]

The steep decline in milk prices and dairy product prices in the last quarter of 1990, evidenced by the $14.93 M-W price in December, 1989 relative to the $10.19 M-W price in December, 1990 raises the big question - "What's ahead?". We can look at the minimum Federal order blend prices in any one of the markets and get a sense of the substantial price stress that has come across the producers sector. December, 1990 blends in Ohio's two Federal order markets were at the $11.30 per cwt. level, down by 27 percent from the $15.50 prices established one year ago.

There are not many things that dairy farmers can do about the price situation - but there are a few. They can take advantage of quality premiums; they can work at improving protein tests when there are protein premiums; they can support generic promotion efforts as they have done since May 1, 1984 with their 15 cent promotion deductions; and they can organize with the intent of becoming price makers rather than price takers. I make this point because in many places at the present time, co-operatives are working harder at stepping into the price breech and negotiating larger over-order premiums. I know, for example, that in the Ohio markets, the over-order blend premiums the last couple of months have averaged about 75 cents per cwt., nearly twice as large as they had been prior to the M-W decline. But producer organization is a continuing challenge, and the basic market supply-demand prices will always be the dominant factor in the effective price level.

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[1]Robert E. Jacobson, Professor, Agricultural Economics, The Ohio State University, for presentation at Sixteenth Southern Dairy Conference, Atlanta, Georgia, February 14, 1991.

Obviously, 1991 and 1992 will see a massively re-newed interest in that latest phrase - "inventory management," i.e., supply management or quotas. Artificially restricting supply can do remarkable things to price - Canada and the European Community give irrefutable evidence of this. And that will capture most of our attention in the next couple of years. But my task this morning is to do a price outlook that makes assumptions such as no drought, no BST in the short term, and no inventory management in the short term.

My intent is to keep this in a straight process of supply, demand, and price - and keep out of the way of other speakers on the program who will be addressing the big policy and GATT questions. Let's consider the following series of tables.

Table 1. Milk Production, Demand, and Surplus, United States, 1985-1991

Year	Milk Production	Commercial Demand	CCC Purchases
	(Bil. Lbs.)	(Bil. Lbs.)	(Bil. Lbs.)
1985	143.1	130.6	13.2
1986[x]	143.4	133.3	10.6
1987[x]	142.5	135.6	6.7
1988	145.2	136.8	8.9
1989	144.2	135.8	9.0
1990	148.3	139.0	8.5
1991[f]	150.7	140.5	8.5

f = forecast; x = whole herd buyout in place last nine months of 1986 and first nine months of 1987.

Milk production increased by over 4 billion pounds in 1990 to a record 148.3 billion pounds. Most of the increase occurred in the second half of the year, and those additional supplies triggered the drops in the cheese and nonfat dry milk markets that lead to the collapse of the M-W price. The momentum in milk production continues into 1991 with the 2.6 percent increase in milk production recorded in January, 1991. The 1.6 percent increase projected for 1991 represents estimates of a modest decrease in cow numbers and a normal (2.3%) increase in production per cow.

The aggregate demand situation continues to be positive with commercial demand estimated at a record 139.0 billion pounds in 1990. More on demand later.

The amount of surplus as measured by CCC purchases has hovered in the 8 to 9 billion pound market in recent years. Until January 1, 1990, the surpluses have been measured on a milkfat equivalent basis. The dairy title of the 1990 Farm Bill stipulates that surpluses as of January 1, 1991 be measured on a total solids basis. ASCS-USDA has recently issued a paper outlining the logic and arithmetic of the new approach and I'd urge you to get acquainted with the procedure. In December, ASCS projected surpluses for 1991 on a total solids basis to be 6.4 billion pounds. However, the high rate of purchases in recent weeks, including nonfat dry milk purchases, is going to change that estimate, and it looks like another year of 8 to 9 billion pounds of surplus - total solids this time. In fact, the five year projections of ASCS suggest that surpluses of milkfat and solids-not-fat will be in some balance with each other.

So much for the supply-demand-surplus background. The big question confronting the milk industry concerns how long it will take for depressed milk prices to

curtail production and thereby bring on stronger milk prices. My view on this is that it's going to take a while, and we are not going to see any strength in milk prices in 1991.

Some of the following points need to be made on the supply side.

1. Milk Cow Numbers - First, notice the long term trend in milk cow numbers for perspective purposes.

Year	Milk Cows, U.S.	
1944	25,597,000 (record)	
1979-June	10,706,000	
1983-Nov	11,137,000 ← just before diversion	
1985-Jan	10,801,000 ← diversion period low	
1986-Jan	11,177,000 ↖	whole herd buyout decrease
1987-Sep	10,411,000 ↙	
1989	10,126,000	
1990	10,127,000	
1991[f]	10,040,000	

In 1990, probably because of the elevated milk prices occurring during much of the period, cow numbers stabilized, i.e., did not decrease as the long term trend suggested they would. Stable cow numbers and increased production per cow meant higher milk production. In fact, the 2.8 percent increase in production per cow in 1990 was significantly above the long term average rate of increase.

Year	U.S. Production Per Cow (Lbs)
1930	4,508
1946	4,886
1985	13,024
1988	14,145
1989	14,245
1990	14,642
1991[f]	15,012
2,000	19,000 - 20,000

In the first half of this century, as illustrated by 1930 and 1946 in the table, annual production per cow in the U.S. hovered in the 4,000 pound plus range. I make that time break there because commercial adoption of artificial insemination made its first inroads in the 1940's. Dairy scientists attribute only about one-fourth of the subsequent increases in productivity to genetic advances, but those productivity changes never occurred until the genetic potential was there. The almost automatic increases in production per cow are significant in the longer term price outlook, because they continue to imply a market situation where supplies exceed commercial demand unless cow numbers, and therefore dairy farmers, exit the industry at a rate almost as fast as the rate of increase in production per cow. Of course, this makes the longer term assumption of no "inventory management".

I have been somewhat intrigued inspecting monthly changes in U.S. milk production since the drought. Take a look at the data in Table 2.

Table 2. U.S. Milk Production - Percent Change From Same Month Previous Year

Month	1988 (%)	1989 (%)	1990 (%)
Jan	+2.9	+2.6	+0.2
Feb	+2.4	+2.5	+1.2
Mar	+2.7	+1.4	+1.6
Apr	+1.7	+1.1	+1.4
May (Drought)	+0.6	-0.1	+1.8
Jun (Drought)	+0.9	-2.5	+3.6
Jul (Drought)	+0.8	-3.1	+5.0
Aug	+0.6	-1.5	+4.0
Sep	+1.6	-2.5	+3.6
Oct	+0.8	-1.7	+3.8
Nov	+1.2	-0.7	+3.9
Dec	+1.2	-1.7	+4.1
	+1.7	-0.6	+2.8
	145.2 Bil. Lbs.	144.2 Bil. Lbs.	148.3 Bil. Lbs.

Three or four observations are in order as we look at the monthly changes in milk production. First, in 1990, the increases of 3, 4, and 5 percent in the second half of the year tell a lot about the price collapse in late 1990. Second, the drought occurred in May, June, and July, 1988. Yet, we never moved into the minus bracket in monthly milk production until a year later - a full year lag in supply response (even using first difference data). Third, the decrease in milk production in the second half of 1989 led to the explosion in milk prices a year ago that topped out at a $14.93 M-W price in December, 1989. Now, a year later, we are seeing a supply response to those high prices.

Is there a lesson here? I'm trying to suggest that the climate disaster of 1988 can be equated with the price disaster of 1991. It took a year to see a full response to the climate disaster. I believe the case can be made that we are at least a year away from seeing low milk prices impact supplies in a way that will permit upward price movement.

Here are five factors that argue that milk producers will have strong staying power in 1991.

1. Substantial dairy farm debt was paid off in 1989-1990.
2. There are ample supplies of high quality - low cost feed and forage available.
3. The recession with unemployment edging toward 7 percent limits off-farm job opportunities.
4. Milk producers normally increase milk output in the short run when milk prices are low in order to maintain cash flow.
5. The Gramm-Rudman assessment will jump from 5 cents per cwt. in 1991 to a minimum of 11¼ cents in 1992 through 1995. The refundable provisions of this assessment point to some base-building by dairy farmers in 1991.

I'm going to by-pass some traditional outlook factors such as (1) cull cow-beef prices which are strong and will work against milk production, and (2) replacement heifer numbers which are substantial and will work for milk production.

Instead, in making the case that milk production will be there in 1991 and into 1992, I will suggest a couple of more things about the financial situation and the feed situation.

The 1989 Farm Costs and Returns Survey has recently been released by the USDA, and I want to lean on those data to suggest the staying power or stickiness of milk producers in 1991. Only a few key measures are lifted from the survey, and these are reported in Table 3.

Table 3. Financial Position of Dairy Farms - Dollars Per Farm

		1985-86	1989-90
Net Worth:			
	U.S.	$ 284,822	$ 456,856
	Southeast	-----	833,153
	Northeast	-----	522,656
	Lake States	-----	352,222
	Pacific	-----	$ 1,296,358
Debt/Asset Ratio:			
	U.S.	0.27	0.18
	Southeast	-----	0.14
	Northeast	-----	0.13
	Lake States	-----	0.20
	Pacific	-----	0.25
Net Farm Income*:			
	U.S.	$ 20,481	$ 45,009
	Southeast	-----	52,996
	Northeast	-----	42,523
	Lake States	-----	40,182
	Pacific	-----	$ 121,903
Farms In Positive Income/Solvency Position		67.3%	84.2%

*N.F.I. = Gross Farm Income - total expenses including depreciation.

The point of emphasizing the data in Table 3 is to support the idea that the milk producer sector, on average, is better able to weather a price storm than it was five years ago. The following points emerge:

1. Net worth of dairy farms increased by 60 percent during the 1985-1990 period.
2. The debt/asset ratio dropped by one-third, from 0.27 to 0.18. Dairy farmers now own 82 percent of the assets on their operations as compared to 73 percent five years ago. Interest costs drop correspondingly.
3. Net farm income for milk producers more than doubled in the past five years.
4. The percent of dairy farms in a positive income/solvency position increased from 67.3% in 1985-86 to 84.2% in 1989-90. (A positive income/solvency position basically means a debt/asset ratio of less than 0.4 and cash income to cover debt repayment and family living).

The second factor having to do with staying power is the feed situation, and a point or two about the milk-feed price ratio is useful here. Note the recent behavior of the milk-feed price ratio.

Milk-Feed Price Ratio → the pounds of 16% protein dairy ration equal in value to one pound of milk.

YEAR	RATIO
1985	1.52
1986	1.57
1987	1.63
1988	1.34
1989	1.44

JAN, 1990	JAN, 1991
$15.34/CWT.	$11.42/CWT.
$186/TON	$181/TON
= 1.69	= 1.31

With feed costs representing the number one operating expense in producing milk, the milk-feed price ratio traditionally offers one insight on the operating situation at the dairy farm. A milk-feed price ratio in the 1.3 to 1.4 range or higher has normally meant the price of milk is "good" relative to the cost of feed. We have had several years of somewhat favorable milk feed price ratios. Now the comparisons of January, 1990 and January, 1991 tell somewhat different stories. However, there are three points to make about the January, 1991 ratio of 1.31.

1. A milk-feed price ratio of 1.31 is not down at the critical 1.1 or 1.2 levels that we have seen at times in the past.
2. The all milk price of $11.42 per cwt. is not going to get much lower.
3. The outlook for corn and soybean prices and therefore for 16 percent dairy ration is not expected to change very much.

Therefore, severely depressed milk-feed price ratios are not expected to be in order and milk supplies will not be facing that kind of interruption.

Demand - There is mostly good news in the aggregate regarding the demand for milk and dairy products. The milk price is down basically because the supply of milk has grown faster than the strong demand for milk since mid-1990. We can set the milkfat situation aside for the moment. As indicated in Table 1, aggregate demand increased by more than three billion pounds in 1990 and is projected to increase by slightly more than one percent in 1991 - in spite of recession. Lower consumer prices for some products are helping the situation.

Two or three points on the demand side are worth noting.

1. Population is a major demand factor. We as a society are adding nearly 1 percent or about 2.5 million consumers to the milk market each year. We are presently at the 252 million population mark, and the market will grow accordingly.

2. Per capita consumption has been on a positive trend in this past decade. On a milkfat equivalent basis, across all dairy products, it was a healthy 572 pounds of cow's milk in 1990. Approximately 97 percent of this is accounted for by commercial demand, with only 3 percent being government donations.

3. It is useful to take a closer look at the fluid market, especially in this higher utilization Southeastern region. We know that per capita consumption of fluid milk products is holding fairly stable at almost 225 pounds, or 26 gallons, per capita annually. Within the mix of fluid milk drinks, there are some remarkable changes that are taking please. The data in Table 4 reflect what has been happening on fluid sales in Federal order markets in the 1980 to 1989 period.

Table 4. Fluid Milk Demand, Federal Order Markets, 1980 and 1989

	1980		1989	
	40.9 Bil. Lbs.		42.2 Bil. Lbs.	
	(Pct.)		(Pct.)	
Whole Milk	58.6		40.8	
Flavored Whole	2.0		1.6	
2% Plain	19.0	30.0%	31.9	43.2%
2% Fortified	4.6		3.7	
1% Plain	4.5		6.4	
1% Fortified	1.9		1.2	
Skim Plain	3.0	4.7%	7.1	8.9%
Skim Fortified	1.7		1.8	
Flavored Lowfat/Skim	2.8		3.4	
Buttermilk	1.7		1.7	
	100.0		100.0	

A first point to note is that the average milkfat test of all Class I milk in Federal order markets has dropped to 2.2 percent. This means that for every 100 pounds of milk received at a fluid processing plant, about 1.5 pounds of milkfat must find a use in some other product -- ultimately butter.

Second, lowfat milks - 2% and 1% - have forged ahead of whole milk as the primary fluid milk product.

Third, skim milk sales as a proportion of fluid milk sales have essentially doubled in the last decade. And the end is not in sight. Skim milk sales could double again in the next decade.

Fourth, the proportions of fortified lowfat and skim milk products have dropped substantially in the past decade. SNF fortification is disappearing. Whether this is due to consumer preference or plant operation considerations or both does not have a clear answer. But the demand for wet or dry solids to fortify fluid milk products is way down; among other things, this will aggravate a SNF surplus problem in the next few years.

Stocks-Inventories - As we enter 1991, we again have moved into a market situation where stocks of dairy products will be keeping a lid on any potential upward price movements. That was not the case a year ago. The CCC bought essentially no cheese for the sixteen month period from July, 1989 to October, 1990; essentially no nonfat dry milk was purchased for the twenty-seven month period from July, 1988 to August, 1990. The cupboard was bare. Note the data in Table 5.

Table 5. Dairy Product Ending Stocks

	Commercial			Government		
	Butter	**Cheese**	**Nonfat Dry Milk**	**Butter**	**Cheese**	**Nonfat Dry Milk**
End of:	Mil. Lbs.	Mil. Lbs.	Mil. Lbs.	Mil. Lbs.	Mil. Lbs.	Mil. Lbs.
1985	36	306	78	181	544	918
1989	52	230	49	222	7	0
1990	46	341	115	366	6	113

The year 1985 in the table represents a somewhat typical year stock-wise prior to the late 1980's. Commercial stocks were nominal, running in the 4-5 billion pound milk

equivalent range; and government stocks were substantial, reflecting surplus situations. The milk industry for many years had learned how to rely on the Commodity Credit Corporation to carry inventories. The notable thing in Table 5 is the absence of inventories of cheese and nonfat dry milk at the end of 1989. This fact, plus the declines in milk production in the second half of 1989 (Table 2) generated the volatile price situation.

Now in early 1991, the government stock situation is different. Nonfat dry milk stocks of 113 million pounds look modest, but they have already built to 170 million pounds by mid-February, and they are increasing by more than 10 million pounds a week. Cheese stocks are in a similar pattern, although the numbers are not as large. The point is that the growing government stock situation is a factor that will continue to push prices toward support levels, at least through 1991.

Prices and Price Support - The forces of supply and demand have interacted in this past year to reflect the price behavior reported in Table 6. Cheese prices are emphasized as they have been the driving factor on the demand side.

Table 6. Milk and Cheese Prices, By Months, 1990

	Support Price (3.5% BF)	CCC Purchase Price, Cheese	40 Lb Blocks Cheddar, Green Bay	M-W Price
Jan 1990	$9.88	$1.11	$1.45	$13.94
Feb	↑	↑	1.26	12.22
Mar	|	|	1.27	12.02
Apr	|	|	1.37	12.32
May	|	|	1.40	12.78
Jun	|	|	1.44	13.09
Jul	|	|	1.46	13.43
Aug	|	|	1.44	13.28
Sep	|	|	1.38	12.50
Oct	|	|	1.15	10.48
Nov	|	|	1.09	10.25
Dec	↓ $9.88	↓ $1.11	1.09	10.19
Jan 1991	$9.90 ↓	$1.11 ↓	$1.09	$10.16

The M-W has almost dropped to the support level. In the up-coming flush period, May through July, the likelihood is that the M-W will drop below the $9.90 support price. We are close to the worst case scenario that milk prices can reflect. The good news is that prices won't get any worse because Title I of the 1990 Farm Bill sets a floor on the support price of $10.10 per cwt. (3.67% BF) through 1995. Prices will not get any lower in the next five years.

The $10.10 support price minimum for the next five years was a substantial price victory for milk producers. Re-call that in the 1985 Farm Act, the dairy support price was stepped down by $2.00 per cwt. over the five year period; in the 1990 Farm Act, the step down was zero.

Purchases of butter, cheese, and nonfat dry milk by CCC to effect the support price have primarily reflected a milkfat surplus in the past couple of years. However, that situation is changing. Note the following record of purchase activity.

CCC Support Purchases

	1989	1990	1991[f]
Butter	413 Mil. Lbs.	401 Mil. Lbs.	265 Mil. Lbs.
Cheese	37	17	160
NFDM	0	118	350
Milkfat Equivalent	9.0 Bil. Lbs.	8.5 Bil. Lbs.	7.0 Bil. Lbs.*

*6.4 Bil. Lbs. Total Solids

The 1991 forecast data reflect ASC projections. Since those computations, purchases have increased significantly and it now appears that purchases in 1991 on either a milkfat equivalent or total solids equivalent will exceed 8.0 billion pounds.

As stipulated in the 1990 Farm Bill, projected purchases of more than 7.0 billion pounds (total solids basis) can trigger producer assessments to cover the higher costs of price support. An assessment of around 7 cents per cwt. will probably be needed to cover each one billion pounds of surplus beyond 7.0 billion pounds. These assessments,

of course, are apart from and would be in addition to the 5 cent and 11¼ cent assessment spelled out for deficit reduction purposes.

The incentive exists in a major way to keep surpluses under 7.0 billion pounds. The machinery to do this is called "inventory management." Intense interest and discussion will be directed to this topic in the next couple of years, and especially after the USDA has submitted its study of the topic to Congress this coming August 1. A supply management program of any kind is more than a year away; it could substantially change the outlook because that is its objective.

Butterfat Differential - A brief point should be made about butterfat differentials. For the first time in more than twenty years, the butterfat differential formula has been changed. It affected December, 1990 milk, and the new formula will be with us for a long time into the future (even with protein pricing). Many producers and some processors were surprised to see the 10.5 cent differential come through on December milk, and 10.4 cents in January. The new formula (Chicago Mercantile Exchange Grade A butter price for the month x 0.138 minus 0.0028 of M-W price at test) is designed to assure that milkfat prices do not move substantially above butter prices when the milk price goes up. Disposing of surplus cream has been an economic disaster for many handlers under the old formula. We'll continue to see lower milkfat values come on, and therefore, higher skim milk values.

Outlook 1991 - The Minnesota-Wisconsin price will be in close relation to the $9.90 support price throughout the year, and will average $10.30 per cwt. for the year.

The all milk price, which was a record $13.78 in 1990, will therefore be down by $2.30 per cwt or 17 percent for the year as compared to 1990.

1992 -1994 - Assuming no inventory management, the milk industry will reflect the following performance:

a. Production per cow will increase and move above the 16,000 pound level in 1994.

b. Cow numbers will decrease significantly in response to the price drop and will drop under the 9.6 million count in 1994.

c. Increase in total milk production will slow up in the next two to three years and will be close to 153 billion pounds in 1994.

d. Aggregate commercial demand will continue to expand at a rate of 1 to 1½ percent per year and will exceed 147 billion pounds in 1994.

e. Surpluses of milk as measured by CCC purchases on a total solid basis will be very large (over 8 billion pounds in 1991) and will shrink to less than 6 billion pounds by 1994.

f. The M-W price will increase at a modest but consistent rate from the $10.30 average annual price for 1991 and will be in the $11.50 range by 1994.